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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/024,581 | 12/21/2001 | Hiroki Takeuchi | 046103-5008 | 2484 |

9629 7590 04/16/2003

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| EXAMINER |
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LAM, CATHY FONG FONG

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| ART UNIT | PAPER NUMBER |
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1775

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DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,581

Applicant(s)

TAKEUCHI ET AL.

Examiner

Cathy Lam

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

In view of the amendment filed on March 26th 2003, the 112 and art rejection have been withdrawn. The amended claims however are continued to be unpatentable as following:

Claim Rejections - 35 USC § 112

1. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6, the phrase "embedded by means of said embedding resin" is indefinite, applicant is suggested to change the phrase to – embedded in said embedding resin --.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard (US 5589714) or Hsiao et al (US 5292688) further in view of Thomas (US 5828126) or Lin et al (US 5468999) or Nishiyama (US 6324067).

Howard discloses a semiconductor device which is encapsulated (or embedded) in a thermosetting resin (col 2 L 19-22).

The thermosetting resin comprised of AlN particles and additives such as pigments or dyes (col 2 L 22-26 & col 5 L 49-51). The pigments or dyes is specifically

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carbon black material (col 7 L 13). The resin material has a dielectric constant of less than 10 (col 4 L 39).

The thermosetting resin is an epoxy resin which can be bisphenol epoxy resin, phenol epoxy novolac, or cresol epoxy novolac resins (col 5 L 18-22).

Hsiao teaches an encapsulant (7) which is used for bonding a semiconductor chip (1) to a substrate (2).

The semiconductor chip is encapsulated (or embedded) by the encapsulating composition (7) (see Fig.). The encapsulating composition (7) is comprised of an epoxy resin and an inorganic filler (col 5 L 1-5, 7-8 & col 4 L 63-65).

The encapsulant has a dielectric constant of less than 5.0 (col 6 L 23-24). The composition further comprises of an organic dye in an amount of less than about 0.2%. such dye can be a blue tone or a carbon black (col 5 L 58-62).

Both Howard and Hsiao disclose the same material used as the claimed invention, it is inherent that Hsiao's encapsulant possess the same $\tan\delta$ value, because $\tan\delta$ is a property and property is materially dependent.

Both Howard and Hsiao disclose an encapsulating material in which an electronic component is embedded. Howard and Hsiao do not however teach a structure having a cavity or opening in which the electronic component resides and that the encapsulating material is used to fill the cavity or opening.

Thomas, Lin and Nishiyama disclose a multilayer structure comprised of a base substrate and a build up layer. The build up layers are made of wiring layers and

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insulating layers in an alternate manner (see Thomas 14a,14b,16a,16b, 24,26,28; and Lin 18, 14, 16, and Nishiyama Figs. 10, 10a,10b, and 13-15).

A cavity is formed in the build up layers, wherein an electronic component is formed within. An epoxy resin encapsulant is used to fill the cavity (Thomas col 6 L 24-26, Lin col 5 L 25-27, Nishiyama col 6 L 57-63 & L 15-18).

In view of the prior art teachings, one skill in the art would use Howard or Hsiao's encapsulating material over a component formed within a cavity because such structure is well known in the art.

Applicant in the claims have included the limitation of having a substrate which is a build up layer, and that the substrate is on the embedding resin. The examiner takes the position that Thomas, Lin and Nishiyama all meet this limitation, because these prior art discloses a build up layer that is adjacent to the embedding resin. The fact that "on the embedding resin" does not necessary mean it is "above" the resin, but it could be "below". The build up layer which is on the embedding resin can be put "on" from the bottom.

Double Patenting

3. Claims 1-7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1- 9 of copending Application No. 10/026,928 which has been allowed recently. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are structurally and materially the same.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (703) 308-2418. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9604 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Cathy Lam
Primary Examiner
Art Unit 1775

cfl
April 14, 2003